

REMARKS

The sole issue outstanding in the Office Action mailed April 13, 2006, is the single rejection under 35 U.S.C §103. Reconsideration of this issue, in view of the following discussion is respectfully requested.

At the outset, it is noted that the claims have been clarified in order to indicate that the extract employed in the method is "refined", as defined in the present specification at page 4, last paragraph, and at page 5, in the description of the Figures.

Claims 1 - 7 remain rejected under 35 U.S.C §103 over Bultman '990 taken with Niwase (JP '345) and Nord, and now also combined with Salas-Morales '051 and Kulperger '766. Reconsideration of this rejection is again respectfully requested.

Bultman discloses a process electrowinning of copper obtained by solvent extraction; specifically, an improvement therein wherein electrowinning is conducted with an electrolyte containing a *fluoroaliphatic* surfactant, which surfactant inhibits mist forming on the surface of the electrolyte. See, for example, column 3, lines 30 - 35. Patentees teach that the fluoroaliphatic surfactant has at least one cationogenic group which is a radical of a base, and containing about 30% by weight of fluorine in the form of carbon-bonded fluorine in a fluoroaliphatic radical, the fluoroaliphatic radical itself having at least four carbon atoms and at least a terminal perfluoro methyl group. See column 3, lines 35 - 42. All throughout patentees' disclosure, the improvement based on *fluoroaliphatic* surfactants is taught. See, for example, column 4, lines 57 - 59, column 5, lines 9 - 12 and the formulae set forth at columns 7 - 9 of the patent. No other surfactants, other than fluoroaliphatic surfactants, are taught by patentees.

As acknowledged at page 2 of the Final Rejection, Bultman fails to teach the surfactant therein as a soluble surfactant which is an extract of the *Quillaja Saponaria* Molina tree. In order to remedy this deficiency, the present and prior Office Actions cite Niwase, teaching that extracts from the *Quillaja Saponaria* Molina tree "had excellent surfactant properties." (Nord is cited solely to provide further detail of the structure of the materials in *Quillaja Saponaria*. As such, it adds nothing to the disclosures of the above-discussed references.)

It is again submitted that, regardless of the existence of any such teaching in this and other secondary references relied upon in the Office Action, the conclusion drawn at the bottom of page 2 of the Final Rejection, that it "therefore" would have been obvious to use the surfactant extract from *Quillaja Saponaria* Molina in the electrowinning process of the primary reference, is contrary to established patent law.

As Applicant's have previously noted, in order to support a rejection under 35 U.S.C §103 based on obviousness, it is necessary that one of ordinary skill in the art has *motivation* to combine references. See, for example, *In re Laskowski*, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989) among many others. *Laskowski* held that the mere fact that references *can* be combined, does not establish motivation, and thus the obviousness to do so, without some suggestion to one of ordinary skill in the art, either from the references themselves or from knowledge in the art, of a reason to make the combination, and, moreover, of a "reasonable expectation of success" in the operability of such a combination or modification. It is respectfully submitted that the mere fact that a surfactant has "excellent" surfactant properties does not render that surfactant, without more, obvious to use in the copper electrowinning process of the primary reference, unless one of ordinary skill in the art would have a reasonable expectation of success with such a surfactant in the electrowinning process of the primary reference. In the present situation, such an expectation is maintained to be absent on several bases.

First, *Quillaja Saponaria* Molina is *not* a fluorsurfactant. For example, attention is directed to Figure 10, setting forth the formula of one such component of the extract. It is well known in the art that *Quillaja Saponaria* Molina extract is not a fluorosurfactant, due to the triterpene chemical structure. It is clear from the teachings of the primary reference that not *any* surfactant is functional therein, but that patentees' *improvement* requires a fluorosurfactant. See, for example, the above-noted passages of the reference. Thus, regardless of any "excellent" surfactant properties known for *Quillaja Saponaria*, this alone is insufficient for one of ordinary skill in the art to find the motivation to employ such a non-fluorosurfactant in the electrowinning process of the primary reference, since the "excellent" properties of a surfactant are *specific* to a given use, and are *not per se* found across a spectrum of uses, as is well known in the art.

The disclosure of Niwase is to a process utterly divorced from, and having nothing in

common with, that of the primary reference. The secondary reference teaches that *Quillaja Saponaria* extract is useful in *shampoo*, and produces beneficial properties for hair. As such, it can be seen that the problem addressed by this reference is of no relation whatsoever to the process of the primary reference, where the conditions of use are far different. In fact, the expectation in the art is the opposite to that theorized in the Office Action: the "excellent" surfactant properties of the material of the secondary reference, said properties being relevant to shampoos, would not be expected to translate in any manner whatsoever to the process of the primary reference.

While various surfactants included saponins can be used as foaming agents in beverages, cosmetics, etc., the choice of surfactants suitable for the suppression of acid mist in electrowinning is not a simple matter. In fact, the only commercial anti-misting agent used widely is a surfactant which contains a fluorocarbon alkyl group connected to an amphoteric group, sold by 3M Corporation under the designation FC-1100 FluoradTM. Such a lack of alternative products speaks volumes against the assumption in the Office Action that any "excellent" surfactant could be used in electrowinning. In fact, electrowinning surfactants have to provide various critical properties such as minimum production of foam, ability to lower surface tension under extreme acidic conditions (e.g., pH of 0 at 50°C) and to avoid interference with copper recovery or retardation of phase separation between organic and aqueous phases when used with ion-exchange materials. Indeed, many candidate surfactants have been shown to exhibit the drawback of being extracted in the organic phase, or interfering with separation time of the organic phase and electrolyte. Such characteristics render them unacceptable in commercial electrowinning operations. Moreover, conditions in electrowinning are different than those found in beverages or cosmetics such as those in the documents cited by the Examiner. The acidity and general process conditions of electrowinning are completely different than such household uses, and the surfactant's ability to perform in such household uses is in no way a predictor of ability to perform, much less to avoid interference with electrowinning process parameters such as current efficiency and cathode quality.

In short, if the assumption in the Office Action that any "excellent" surfactant is obvious for use in electrowinning were true, widely available surfactants such as sodium lauryl sulfate

would likely be used to reduce acid mist in electrowinning. Indeed, such products have been tested: Alfantazi et al., 2004, " The Use of Organic Additives to Suppress Acid Mist in Copper Electrowinning", *Canadian Metallurgical Quarterly*, **43**, pp. 449-460. These products, have not, however resulted in commercial products accepted in the electrowinning industry as a result of the production of abundant foam over the electrolyte, and alteration of cathode quality.

Thus, the attempt in the final rejection to bridge the gap between beverage and shampoo surfactants and the electrowinning process, citing Salas-Morales, and arguing that patentees teach "other, non-fluoroaliphatic surfactants" used in copper electrowinning processes, fails as a teaching that *any* surfactant can be used.

In fact, the teachings of Salas-Morales, that the materials produce a *foam*, would have *dissuaded* one of ordinary skill in the art from using materials such as those disclosed therein, much less materials other than that of the primary reference. It is known that a major drawback of various fluorosurfactants taught for use in copper electrowinning is that they produce a foam over the electrolyte. For example, Anisch et al. (USP 5, 468,353) teaches the desirability of inhibiting the mist or spray formed over metal electrowinning tanks with flow aliphatic *non-foam-forming* surfactants, teaching at column 1, lines 17 and 18 and column 2, lines 54 - 62, that the fluorosurfactant of the primary reference cited by the Examiner (Bultman) results in a foam which, while it inhibits acid mist formation, produces bubbles which present a potential fire hazard. The Anisch patent teaches that the fluorosurfactant disclosed therein overcome such undesirable foam formation.

Ainsch thus teaches one of ordinary skill in the art two things. First, that while surfactant inhibits mist formation; the foam bubbles produced are undesirable. Secondly, the patent teaches that not even all fluorosurfactants are desirable in electrowinning.

Kulperger, also cited in the Office Action, teaches various properties of *Quillaia* extract, but discloses utilities thereof in order clarification in solid surface cleansing. The mere knowledge that *Quillaia* extract functions as a surfactant, which is well known, as discussed above does not provide the necessary motivation for one of ordinary skill in the art to combine this material in the process of the primary reference. As discussed above, to support motivation, it is also required by law for the references to establish a "reasonable expectation of success."

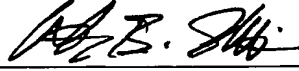
See, for example, *Merck v. Biocraft*, 10 USPQ2d, 1843 (Fed Cir 1989). It is clear, from the teachings and the references, that there is no reasonable expectation of success with just *any* surfactant, as the Office Action appears to suggest. Indeed, the art teaches even that the surfactant of the primary reference, a fluorosurfactant, possesses undesirable properties, e.g., the production of a foam which is a fire hazard. As taught in the present specification, at page 4, the third paragraph, the presently claimed surfactant results in insignificant foam generation.

It is accordingly respectfully submitted that the mere fact that some surfactants have been shown to function both in electrowinning processes, and in other uses, is not a teaching that absolutely any known surfactant could be used in an electrowinning process. Thus, in the absence of such a reasonable expectation of success, motivation to employ virtually any disclosed surfactant in the world in an electrowinning process is sorely lacking, contrary to the suggestion in the Office Action. Accordingly, it is submitted that the rejection under 35 U.S.C §103 should be withdrawn.

The claims of the application are submitted to be in condition for allowance. However, should the Examiner have any questions or comments, he is cordially invited to telephone the undersigned at the number below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



Harry B. Shubin, Reg. No. 32,004
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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